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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/677,024	09/30/2003	Alan R. Arthur	200311580-1	9379

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EXAMINER	
CHUO, TONY SHENG HSIANG	
ART UNIT	PAPER NUMBER
1795	

NOTIFICATION DATE	DELIVERY MODE
04/14/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/677,024	ARTHUR ET AL.	
	Examiner	Art Unit	
	Tony Chuo	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 February 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *12-31* is/are allowed.

6)☒ Claim(s) *1 and 9-11* is/are rejected.

7)☒ Claim(s) *2-8* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see Appeal Brief, filed 2/19/08, with respect to the rejection(s) of claim(s) 1 under 35 USC 102(e) and 35 USC 103(a) have been fully considered and are persuasive. Therefore, the rejections have been withdrawn. However, upon further consideration, new ground(s) of rejection are made in view of Ito and Bennett.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Ito (JP 04-355953).

The Ito reference discloses a method of dispersing stress by forming an interface between a components having different rates of thermal expansion (molybdenum plate "15" and copper plate "8") such that when thermal expansion is induced by heating, a slide occurs at an interface between the plates "8" and "15" (See Abstract).

Examiner's note: According to the applicant's specification, a center of growth is a point at which two or more planes containing a portion of an interface between two

components intersect. The Ito reference teaches forming an interface between two plates which inherently would be formed at a point where two planes containing a portion of an interface between the two plates intersect.

4. Claims 1 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Bennett (US 3577795).

The Bennett reference discloses a method of forming an interface between components having different rates of thermal expansion (carbide blank "42" and steel shaft "44") such that the interface between the components is aligned with the direction of the resultant thermal expansion so that one component slides upon the other component during such an expansion (See column 2, lines 10-14). It also discloses a method of determining the total resultant expansion of interface point "62" (center of growth) on the interface between abutting flanks "50" & "56", wherein an increase in temperature results in sliding between the abutting flanks (See column 4, lines 16-65). It also discloses that if this method of performed with both carbide and steel raised to the maximum temperature expected in operation and then allowed to cool, the assembly will automatically be capable of operating at that particular temperature without encountering unwanted interference (See column 4, lines 52-56).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1 and 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Piascik et al (US 6677069) in view of Bennett (US 3577795).

The Piascik reference discloses a radial solid oxide fuel cell stack "100" comprising components that have different rates of volumetric expansion such as cells "106" that are made of ceramic materials and interconnect layers "108" & "110" that are made of an metal sheets (See Figure 3 and column 7, lines 52-53, column 8, lines 48-58).

However, Piascik does not expressly teach a method of forming an interface comprising a step of forming an interface surface with respect to a center of growth such that slippage occurs at the interface between the components during volumetric expansion. The Bennett reference discloses a method of forming an interface between components having different rates of thermal expansion such that the interface between the components is aligned with the direction of the resultant thermal expansion so that one component slides upon the other component during such an expansion (See column 2, lines 10-14). It also discloses a method of determining the total resultant expansion of interface point "62" (center of growth) on the interface between abutting flanks "50" & "56", wherein an increase in temperature results in sliding between the abutting flanks (See column 4, lines 16-65).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Piascik fuel cell to include a method of forming an interface comprising a step of forming an interface surface with respect to a

center of growth such that slippage occurs at the interface between the components during volumetric expansion in order to accommodate thermal expansions without subjecting the components to deleterious thermal stresses (See column 2, lines 31-34).

Allowable Subject Matter

7. Claims 12-31 are allowed. Claims 2-8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The Higgins reference discloses forming an interface surface on spherical housing "32" such that slippage occurs at the interface between the spherical housing and the semispherical flange "26" during thermal expansion (See column 2, lines 35-42). However, Higgins does not expressly teach a method of forming a thermally cycled component assembly comprising the steps of: determining dimensional characteristics of the first component, defining an axis of volumetric expansion for the first component, projecting a sphere having a center on the axis, and defining the center of the sphere as a center of growth of the first component.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony Chuo whose telephone number is (571)272-0717. The examiner can normally be reached on M-F, 7:00AM to 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TC

/Jonathan Crepeau/
Primary Examiner, Art Unit 1795